



**Model DET-56 Digital Earth Station**

**Scientific  
Atlanta**

**Satellite Communications Products**



## **The packaged digital earth station for satellite business communications**

If your organization needs to transmit digital data, voice, telex, or facsimile between branches or other geographically separated facilities, the Scientific-Atlanta DET-56 Digital Earth Station can enable you to realize the many benefits of satellite communications economically and easily.

The DET-56 is a completely packaged, standard-product digital earth station that is ready for installation on rooftop or parking lot. The compactness of its 5-meter antenna and other equipment allows you to set it up on your own premises if you wish. And its reliability is unsurpassed.

That's because the DET-56 was developed by Scientific-Atlanta, one of the world's most experienced designers and manufacturers of satellite communications equipment. By the end of 1979, there will be over 1,500 Scientific-Atlanta earth stations operating around the globe in the full range of applications.

For your satellite digital transmission needs, you can't buy better experience or higher quality than Scientific-Atlanta offers.

## **Cost and quality advantages**

The Scientific-Atlanta DET-56 Digital Earth Station is designed for business and other applications where reliable, economical communications of voice, data, facsimile, teletype, or slow scan television are required. The important costs and quality advantages associated with satellite transmission of digital data are:

- The terminal can carry from one to eight 56 Kbps channels.
- It has quality and reliability generally superior to wireline and terrestrial microwave systems.
- It can communicate to remote areas not served by digital grade wireline circuits.
- It is economically competitive with wire-line tariff circuits.
- It has higher data rates than those available via wire-line.





Model 8363-3 Upconverter



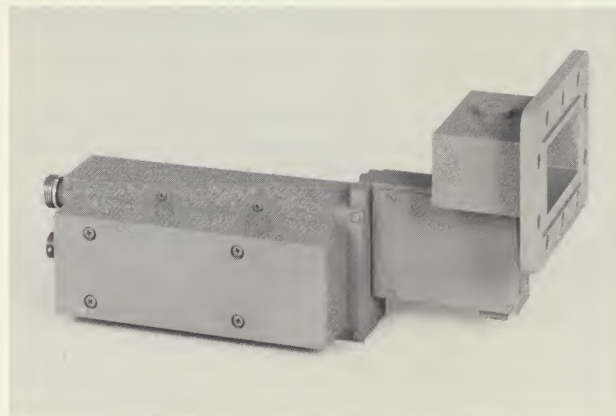
Model 8362-3 Downconverter

## Meet all your needs with one package

With the DET-56 you avoid the time-consuming complexities of multi-source equipment purchases and the costs of integrating equipment from different manufacturers. In a single package, you get an efficient, cost-effective method of transmitting data among your various locations.

The DET-56 operates in the 4 and 6 GHz frequency ranges, and includes a 5-meter antenna, frequency converters, HPA's, LNA's, modems, monitor and control subsystem, plus all associated racks, waveguides, and cabling. Options such as stand-alone equipment shelter, higher data rates, and higher EIRP are also available.

The design of the DET-56 provides exceptionally reliable performance; fast, easy installation and maintenance; unattended operation; and economical, modular expansion capability.

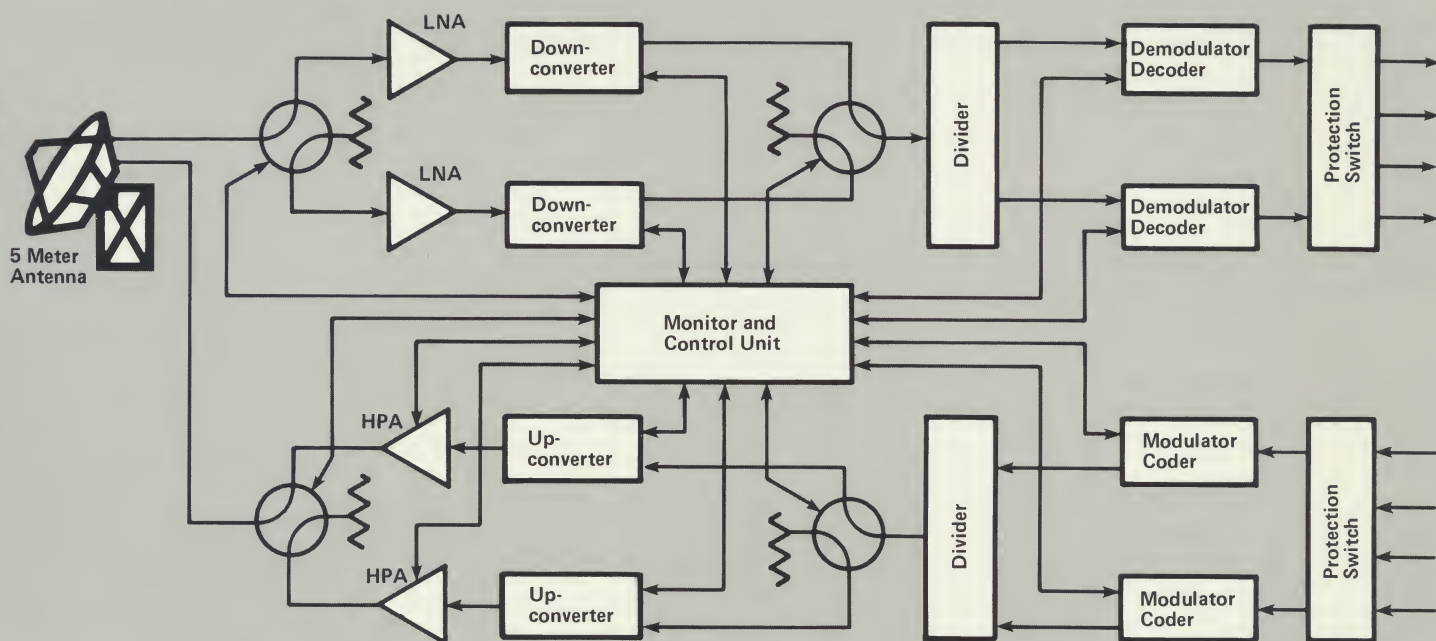


GaAs FET Low Noise Amplifier



High Power Amplifiers





DET-56 Simplified Block Diagram

## DET-56 Description

The DET-56 employs the Scientific-Atlanta Model 8008 5-meter diameter antenna. The antenna is a simple elevation-over-azimuth mount and operates over the bands 3.7 to 4.2 and 5.925 to 6.425 GHz.

Highly reliable GaAs FET low noise amplifiers (LNA's) are used, plus frequency flexible dual conversion down converters and up converters; wide band traveling wave tubes (TWT's) of proved reliability; Biphase Shift Keying (BPSK) or Quad-phase Shift Keying (QPSK) modems with rate 7/8 forward error correction codecs; a one-for-N (1:N) modem protection switch and system Monitor and Control. A block diagram of the DET-56 is shown above.

The wideband LNA and power amplifiers provide the capability of selecting any frequency in the domestic or international operating frequency range (3.7 - 4.2 and 5.925 - 6.425 GHz) without tuning. The up and down converter provide satellite transponder selection by simple switching and phase-locking. The modems provide any frequency within a transponder by either a crystal selection or synthesizer.

The modem utilizes square root of Nyquist band limited spectrum to allow close stacking of carriers in a satellite transponder and provides guaranteed performance to within 1.5 dB of theory in either the encoded or unencoded mode. Interfaces are compatible with CCITT recommendation V.35 and Bell Publication No. 41450. An internal bit rate clock is optional. The codec (an integral part of the modem) uses a convolutional self-orthogonal code which has a minimum distance of 7 and is triple-error correcting.

The 1:N protection switch provides monitoring of the on-line digital modems and the standby unit. The protection switch utilizes a microprocessor design for intelligent monitoring and control of the modems. The switch operates the standby modem in the "looped-back" mode to provide "guaranteed" performance in the event it becomes necessary to place the unit on line.

Control and status of the DET-56 is available via a central monitor and control panel. Indicator lamps and switches provide both status and the capability of manual override for maintenance purposes. All status and control of the DET-56 are remotable from a central panel.



Model 8802 QPSK Demodulator/FEC Decoder

Model 8801 QPSK Modulator/FEC Encoder

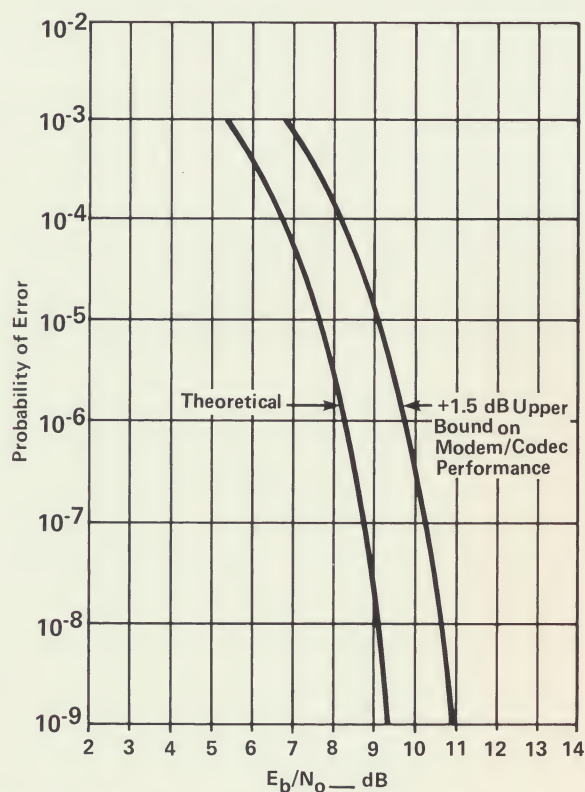




## DET-56 Performance

The DET-56 is an extremely efficient terminal designed for maximum performance with the minimum use of the satellite power and frequency spectrum. Key system specifications of the terminal include:

- Performance —  $\leq 1 \times 10^{-7}$  BER @  $E_b/N_0$  of 10.2 dB
- G/T — 22.0 dB/k
- EIRP — 53 dBW (single carrier)  
63.9 dBW (multiple carrier)
- Transmission Mode — BPSK or QPSK
- Channel Spacing ( $\geq 7$  bit rate QPSK)  
( $\geq 1.4$  bit rate BPSK)
- Required Satellite EIRP/Channel — 8 dBw
- Availability — 0.99995, redundant configuration



Specified Upper Bound on Modem/Codec Performance

## Service

Scientific-Atlanta maintains fully staffed service centers at the factory and other locations throughout the country to provide regularly scheduled and emergency service for Scientific-Atlanta products. Many customers contract with Scientific-Atlanta for regularly scheduled service. This gives maximum insurance against equipment failures and reduces response time in the event of a failure. A schedule of services and service rates is available upon request.

## Scientific-Atlanta Background

Scientific-Atlanta designs, manufactures, and markets communications equipment and instrumentation products for test and measurement of the quality and performance of various types of telecommunications equipment, antenna test equipment, and telemetry products.

Communications equipment includes antennas, receivers, transmitters, and other electronic equipment used on satellite earth stations, in cable television receiving and distribution systems, in wireless home security systems and energy related products.

## **Sales Offices**

**No. California Regional Office**  
2025 Gateway Place, Suite 320  
San Jose, California 95110  
Tel: 408-286-9152

**So. California Regional Office**  
P.O. Box 2668  
10039 Pioneer Boulevard  
Santa Fe Springs, California 90670  
Tel: 213-949-9302

**Southwestern Regional Office**  
Suite 1131, Frito-Lay Tower  
Dallas, Texas 75235  
Tel: 214-357-1855

**Midwestern Regional Office**  
6400 W. Main Street  
Belleville, Illinois 62223  
Tel: 618-397-9251

**New England Regional Office**  
87 Terrace Hall Avenue  
Burlington, Massachusetts 01803  
Tel: 617-272-1256

**Mid Atlantic Regional Office**  
135 Fort Lee Road  
Leonia, New Jersey 07605  
Tel: 201-461-5340

**Washington D.C. Regional Office**  
Priest Bridge Business Park  
2121 Baldwin Avenue, Suite 25A  
Crofton, Maryland 21114  
Tel: 301-261-3233

**Southeastern Regional Office**  
3845 Pleasantdale Road  
Atlanta, Georgia 30340  
Tel: 404 449-2000

**Scientific-Atlanta (CANADA), Ltd.**  
1640 Bonhill Road, Unit 6  
Mississauga, Ontario  
L5T 1C8, Canada  
Tel: 416-677-6555

**Scientific-Atlanta (U.K.), Ltd.**  
1-7 Sunbury Cross Centre  
Staines Road West  
Sunbury on Thames  
Middlesex, TW16 7BB, England  
Tel: Sunbury on Thames 89751

**Scientific-Atlanta (FRANCE) SARL**  
Centre d'Affaires Paris - Nord  
Batiment Ampere No. 5  
93153 Le Blanc - Mesnil, France  
Tel: 931 6820, Paris

## **Scientific-Atlanta, Inc.**

United States: 3845 Pleasantdale Road, Atlanta, Georgia 30340; Telephone 404-449-2000; TWX 810-766-4912; Telex 0542898  
Canada: 1640 Bonhill Road, Unit 6, Mississauga, Ontario, L5T 1C8, Canada; Telephone 416-677-6555; Telex 06983600  
Europe: 1-7 Sunbury Cross Centre, Staines Road West, Sunbury on Thames, Middlesex TW16 7BB, England  
Telephone Sunbury on Thames 89751; Telex 896015